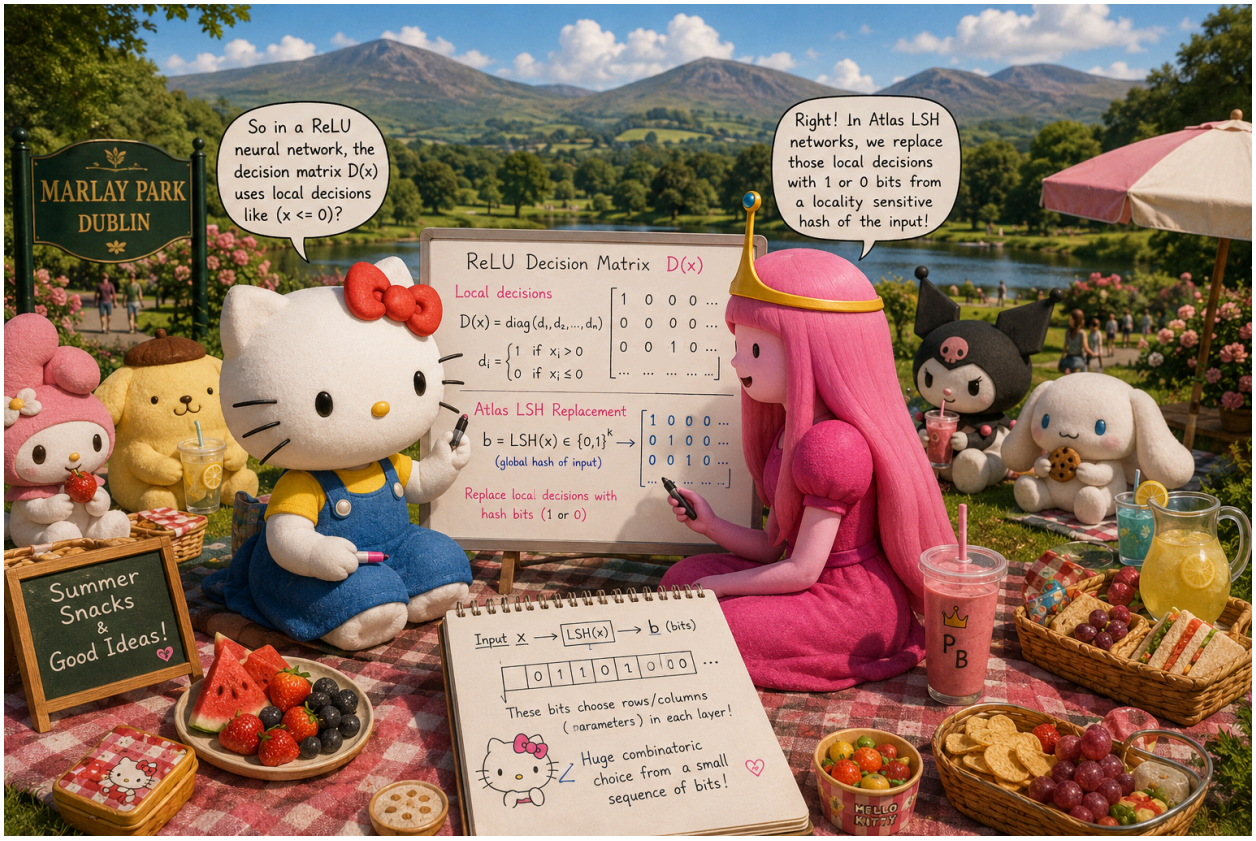
MARLAY PARK
DUBLIN
So in a ReLU neural network, the decision matrix D(x) uses local decisions like (x <= 0)?
Right! In Atlas LSH networks, we replace those local decisions with 1 or 0 bits from a locality sensitive hash of the input!
ReLU Decision Matrix D(x)
Local decisions
D(x) = diag(d1, d2, ..., dn)
di = { 1 if xi > 0 ; 0 if xi ≤ 0 }
1 0 0 0 ...
0 0 0 0 ...
0 0 1 0 ...
... ...
Atlas LSH Replacement
b = LSH(x) ∈ {0,1}^k
(global hash of input)
Replace local decisions with hash bits (1 or 0)
1 0 0 0 ...
0 1 0 0 ...
0 0 1 0 ...
... ...
Summer Snacks & Good Ideas!
Input x → LSH(x) → b (bits)
0 1 1 0 1 0 0 ...
These bits choose rows/columns (parameters) in each layer!
Huge combinatoric choice from a small sequence of bits!
PB
HELLO KITTY

An Atlas Neural Network From a ReLU Neural Network. DW is row select, WD is column select. Since D=DD you can have $W_2DW_1 = W_2DDW_1 = (W_2D)(DW_1)$.